REMARKS

Claim Rejections 35 U.S.C. § 112, second paragraph

The Examiner has rejected claims 1-5 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicant has amended claims 1-5 to more particularly point out and distinctly claim the subject matter which Applicant regards as the invention. As such, Applicant respectfully requests the removal of the 35 U.S.C § 112 second paragraph rejection of claims 1-5.

Claim Rejections 35 U.S.C. § 102/§ 103

The Examiner has rejected claims 1-4, 6-8 and 10-19 under 35 U.S.C. § 102(e) as being anticipated by Efland et al. (6025275). The Examiner has rejected claims 5, 9 and 20 under 35 U.S.C. § 103(a) as being unpatentable over Efland et al (6025275) as applied to claims 1-4, 6-8 and 10-19 and further in view of Byrne (5136364).

It is Applicant's understanding that the cited references fail to individually or collectively to teach or render obvious Applicant's invention as claimed in claims 1-20. Applicant teaches and claims a method of fabricating a passivation structure which is both hermetic and which exhibits extremely low capacitance. Accordingly, Applicant teaches to form a first dielectric layer over an outer level of metalization which includes a bond pad and interconnects. Applicant then teaches and claims to deposit a first dielectric having a low dielectric constant between the interconnects and bond pads and to a thickness to ensure complete filling of the gaps between the interconnects and bond pads with the first low dielectric constant dielectric. A low dielectric constant film formed between the interconnects and bond pads reduces the line to line capacitance of the device. Next, a sealing dielectric which is formed of a material which is resistant to moisture penetration (i.e., formed of hermetic material) is formed on the first dielectric. Because a first dielectric is formed to a thickness sufficient to fill the gaps between interconnects and bond pads the hermetic sealing dielectric is kept out of the gaps between lines and bond pads. It is

to be appreciated that hermetic layers, such as silicon nitride, have high dielectric constants and so it is important to keep high dielectric constant films above the metal features and out of gaps so that the high dielectric constant does not increase the capacitive coupling between adjacent metal features and thereby decrease the device performance. An opening is then formed through the first and second dielectric openings over the bond pad and the barrier layer and a contact formed thereon to hermetically seal the side of the passivation layer. The first hermetic dielectric and the barrier layer combined to form a hermetic seal of the substrate. Because the barrier layer and the hermetic layer provide a hermetic seal for the substrate the first dielectric layer can be formed of a material which has a low dielectric constant but which is not resistant to moisture penetration. By completely filling gaps with a low dielectric constant material there is a low interconnect capacitance (low capacitive coupling) between adjacent metal features which results in improved (faster) device performance. In this way, the present invention provides a passivation structure which is both hermetic (resistant to moisture penetration) and which exhibits extremely low capacitants.

Accordingly, Applicant claims in claims 1-5 forming a "first dielectric having a dielectric constant at least as low as silicon oxide" to a thickness to sufficient to fill the "gap" between a bond pad and an interconnect and then forming a second "hermetic" dielectric on the first dielectric. With respect to claims 6-20 Applicant claims forming a "first dielectric" which fills "gaps" between adjacent lines and "forming a second dielectric layer over the first dielectric layer" and wherein the second dielectric layer has a second dielectric constant greater than the first dielectric constant.

The Examiner cites Efland et al as essentially teaching all elements of Applicants passivation methodology except for the use of a nickel-vanadium barrier layer which the Examiner cites Byrne as teaching.

It is Applicant's understanding that Efland fails to teach a passivation layer as claimed by Applicant. It is Applicant's understanding that Efland fails to teach or suggest a method of forming a passivation structure which is both hermetic and

which has low capacitive coupling. Efland describes the use of a standard passivation film 22. It is to be appreciated that Efland is not concerned with providing an improved passivation film but rather with how to remove high parasitic resistances associated with bond pads and standard multilevel VLSI metal systems. As such Efland provides no new teachings about passivation film and structures. Eflan describes that the passivation layer 22 can be an oxide and a nitride or an oxide and an oxynitride. (Column 3, lines 40-45) Efland provides not further teaching or suggestion on how to improve the quality and performance of the passivation film. Efland fails to teach that the oxide portion of the passivation should be formed thick enough to completely fill the gaps between bond pads and interconnects and that the nitride or oxynitride portion should be formed above the metalization in order to prevent its high dielectric constant from negatively impacting the line to line capacitance.

Efland clearly fails to teach or suggest a method of forming a low capacitance hermetic passivation film as claimed by Applicant. Applicant therefore respectfully request the removal of the 35 U.S.C 103 rejections of claims 1-20 and seeks early allowance of these claims.

If there are any additional charges, please charge Deposit Account No. 02-2666.

Respectfully submitted,

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